第 1 章 3.「分数式の計算」「平方根」 第 1 回

解答

1. (1) $\dfrac{2a^2b^2}{3c}$ (2) $\dfrac{x(x+y)}{y(x-y)}$ (3) $\dfrac{x+2}{x-2}$

2. (1) $\dfrac{3x+4}{(x+1)(x+2)}$ (2) $\dfrac{1}{ab}$ (3) $\dfrac{1}{x(x+1)^2}$

3. (1) $\dfrac{b^3}{12a^2c}$ (2) $\dfrac{(x-2)(x+2)}{(x-1)(x+3)}$

4. (1) $2\sqrt{2}$ (2) $-10-5\sqrt{6}$ (3) $47+12\sqrt{15}$

5. (1) $\dfrac{\sqrt{6}}{2}$ (2) $\sqrt{3}-\sqrt{2}$ (3) $7+4\sqrt{3}$

解説

1. (1) 与式 $= \dfrac{8a^6b^9c^3}{12a^4b^7c^4} = \dfrac{2a^2b^2}{3c}$ (2) 与式 $= \dfrac{xy(x+y)}{y^2(x-y)} = \dfrac{x(x+y)}{y(x-y)}$

(3) 与式 $= \dfrac{(x+1)(x+2)}{(x+1)(x-2)} = \dfrac{x+2}{x-2}$

2. (1) 与式 $= \dfrac{x+2}{(x+1)(x+2)} + \dfrac{2(x+1)}{(x+1)(x+2)} = \dfrac{x+2}{(x+1)(x+2)} + \dfrac{2x+2}{(x+1)(x+2)} = \dfrac{3x+4}{(x+1)(x+2)}$

(2) 与式 $= \dfrac{1}{b(a-b)} - \dfrac{1}{a(a-b)} = \dfrac{a}{ab(a-b)} - \dfrac{b}{ab(a-b)} = \dfrac{a-b}{ab(a-b)} = \dfrac{1}{ab}$

(3) 与式 $= \dfrac{1}{x(x+1)} - \dfrac{1}{(x+1)^2} = \dfrac{x+1}{x(x+1)^2} - \dfrac{x}{x(x+1)^2} = \dfrac{1}{x(x+1)^2}$

3. (1) 与式 $= \dfrac{2c^2}{9a^3b} \times \dfrac{3ab^4}{8c^3} = \dfrac{1}{3a^2} \times \dfrac{b^3}{4c} = \dfrac{b^3}{12a^2c}$

(2) 与式 $= \dfrac{(x-2)^2}{(x-1)(x+1)} \times \dfrac{(x+1)(x+2)}{(x-2)(x+3)} = \dfrac{x-2}{x-1} \times \dfrac{x+2}{x+3} = \dfrac{(x-2)(x+2)}{(x-1)(x+3)}$

4. (1) 与式 $= 5\sqrt{2} + 3\sqrt{2} - 6\sqrt{2} = 2\sqrt{2}$

(2) 与式 $= 4\left(\sqrt{2}\right)^2 - 8\sqrt{6} + 3\sqrt{6} - 6\left(\sqrt{3}\right)^2 = 4 \times 2 - 5\sqrt{6} - 6 \times 3 = -10 - 5\sqrt{6}$

(3) 与式 $= \left(3\sqrt{3}\right)^2 + 2 \times 6\sqrt{15} + \left(2\sqrt{5}\right)^2 = 9 \times 3 + 12\sqrt{15} + 4 \times 5 = 47 + 12\sqrt{15}$

5. (1) 与式 $= \dfrac{3\sqrt{2}}{2\sqrt{3}} \times \dfrac{\sqrt{3}}{\sqrt{3}} = \dfrac{3\sqrt{2}\sqrt{3}}{2\left(\sqrt{3}\right)^2} = \dfrac{3\sqrt{6}}{2 \times 3} = \dfrac{\sqrt{6}}{2}$

(2) 与式 $= \dfrac{\sqrt{3}-\sqrt{2}}{\left(\sqrt{3}+\sqrt{2}\right)\left(\sqrt{3}-\sqrt{2}\right)} = \dfrac{\sqrt{3}-\sqrt{2}}{\left(\sqrt{3}\right)^2 - \left(\sqrt{2}\right)^2} = \dfrac{\sqrt{3}-\sqrt{2}}{3-2} = \sqrt{3}-\sqrt{2}$

(3) 与式 $= \dfrac{2+\sqrt{3}}{2-\sqrt{3}} \times \dfrac{2+\sqrt{3}}{2+\sqrt{3}} = \dfrac{\left(2+\sqrt{3}\right)^2}{\left(2-\sqrt{3}\right)\left(2+\sqrt{3}\right)} = \dfrac{2^2 + 2 \times 2\sqrt{3} + \left(\sqrt{3}\right)^2}{2^2 - \left(\sqrt{3}\right)^2} = \dfrac{4+4\sqrt{3}+3}{4-3} = 7+4\sqrt{3}$